## Space Weather Forecast

Issued on Saturday 28 September 2024 at 01:25 Local

**This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales**

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**Space Weather Forecast Headline: Chance of Moderate-class flares.**

**Analysis of Space Weather Activity over past 24 hours**

**Solar Activity:** Solar activity has been Moderate with the largest flare at 27/0800 UTC from a region just on or beyond the southeast limb. There are currently eleven sunspot regions on the visible disc, the majority of which are small and simple. The largest of these is in the southeast of the east. It consists of a number of spots of one polarity, with weak trailing spots of opposite polarity and is a simple region overall. A region near south centre disc has seen some maturation and growth over recent hours. The new region close to the southeast limb is difficult to assess due to foreshortening but is likely responsible for the largest flare over the past 24 hours.

There were no Earth-directed Coronal Mass Ejections (CMEs) observed. A CME seen emerging towards the southeast was modelled to not have an Earth-directed component. However, reanalysis is currently underway for confirmation.

**Solar Wind / Geomagnetic Activity:** Solar winds showed a declining trend. Wind speeds eased from around 360 km/s to near 300 km/s. Interplanetary Magnetic Field was weak, with the north-south component weakly variable but largely southward directed until 27/1115 UTC and mostly northward since. Geomagnetic activity was Quiet (Kp 0-2) throughout.

**Energetic Particles / Solar Radiation:** The count rate of energetic particles remained at background levels with no solar radiation storms observed.

**Four-Day Space Weather Forecast Summary**

**Solar Activity:** Low to Moderate activity is expected, with a chance of further isolated Moderate-class flares. New regions are expected to rotate onto the disc during the period.

**Solar Wind / Geomagnetic Activity:** No Earth directed CMEs are currently expected. The current background solar winds are expected to persist until a possible weak fast wind enhancement occurs, with wind speeds perhaps reaching around 450km/s. The fast wind onset is expected late on Day 1 or during Day 2 (28-29 Sep).

Mainly Quiet (Kp 0-2) geomagnetic conditions are expected. The onset of any coronal hole fast wind could bring a spell of Unsettled to Active (Kp 3-4) intervals late on Day 1, but more probably on Day 2.

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**Energetic Particles / Solar Radiation:** The count rate of energetic particles is forecast to persist at background levels with just a very slight chance of solar radiation storms occurring.

## Geomagnetic Storms

| Geomagnetic Storm Probability (Exceedance) | Level | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Minor or Moderate | G1 to G2 | No | 5 | 5 | 1 | 1 |
| Strong | G3 | No | 1 | 1 | 1 | 1 |
| Severe | G4 | No | 1 | 1 | 1 | 1 |
| Extreme | G5 | No | 1 | 1 | 1 | 1 |

## Radio Blackouts - X-Ray Flares

| X-Ray Flares Probability | Level | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Active | R1-R2 (M Class) | Yes | 50 | 50 | 50 | 50 |
| Very Active | R3-R5 (X Class) | No | 5 | 5 | 5 | 5 |

## Solar Radiation Storms (High Energy Protons)

| Radiation Storms Probability (Exceedance) | Level ($cm^{-2}sr^{-1}s^{-1}$) | Past 24 Hours (Yes/No) | Day 1 (00-24 UTC) (%) | Day 2 (00-24 UTC) (%) | Day 3 (00-24 UTC) (%) | Day 4 (00-24 UTC) (%) |
|---|---|---|---|---|---|---|
| Active | ≥ S1 | No | 5 | 5 | 5 | 5 |
| Very Active | ≥ S3 * | No | 1 | 1 | 1 | 1 |
| * S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$) | | | | | | |

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